



EO/IR Payload Display



EO/IR Payload Display

- Function: Provide timely display of payload status data and payload controls in support of effective use of the payload in imagery collection
- Applicable CSCs:
 - EO/IR Imagery Viewer & Capture
 - EO/IR Payload Control
- CSCs are linked depending on role



Design Drivers

- Situational Awareness
- Object of Interest Recognition & Assessment
- Minimum imagery capture rate of once every 15 seconds
- Minimum translation/alteration of image data to preserve original for C4I systems



Design Approach

- Analyze roles - determine functionality required
- Collect suggestions and comments from operators at demos and AWEs
- Layout a display design
- Implement and take to demos and AWEs



Implementation Approach

- Draw video overlays (via standard windowing API) into Parallax HW memory
 - Create overlays at the workstation - avoid “burning” overlays into video
 - Overlays can be converted to CGM for NITF files - C4I user can view overlays as required
- Reformat data from Parallax HW only as much as required for NITF compatibility



Functional Breakout

- Broken into three functional areas
 - EO/IR video display
 - NITF capture
 - EO/IR Payload controls
- Functions can be presented in a single HCI window as required by a given role

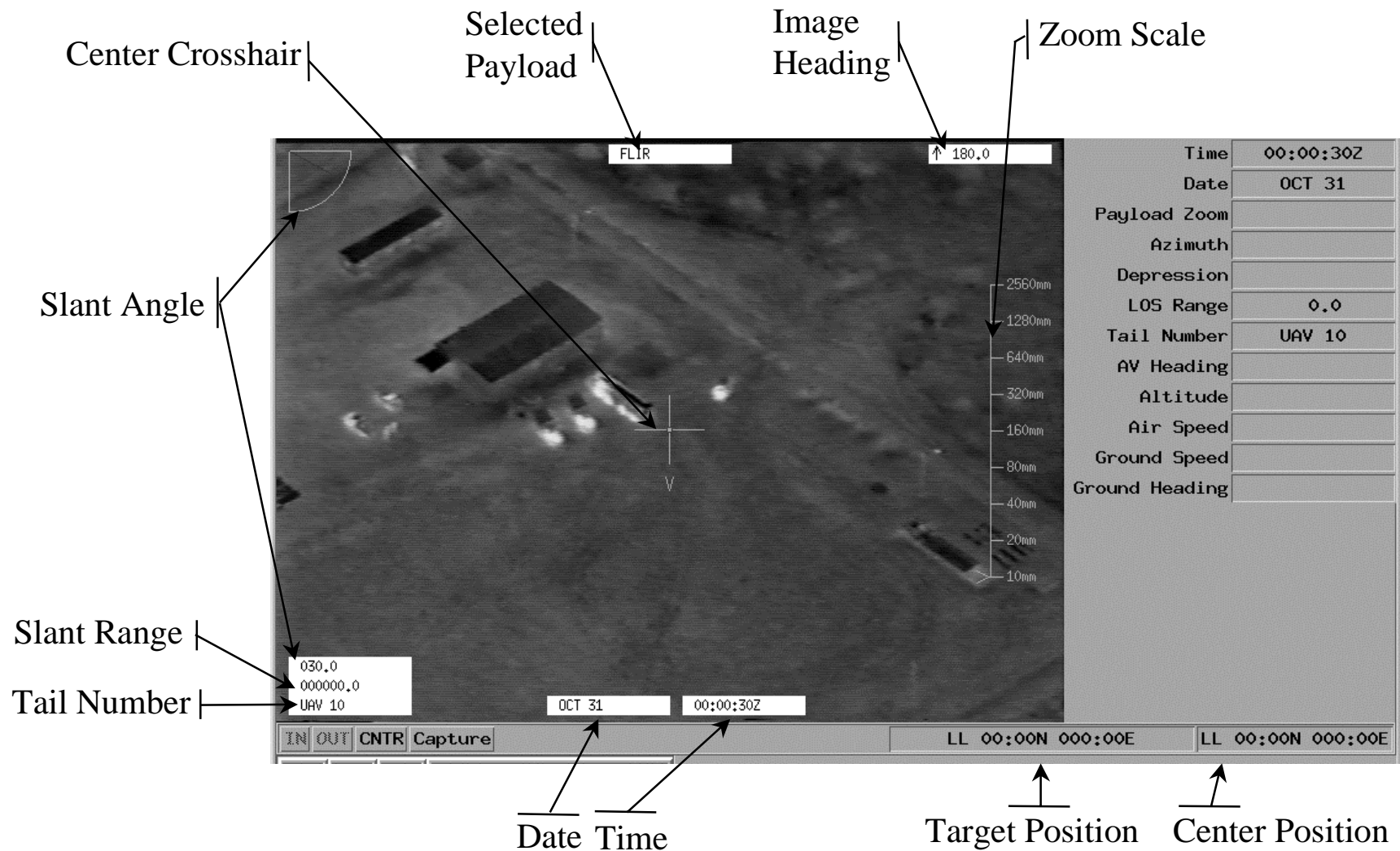


EO/IR Video Display

- Operator's view of what the payload is seeing
- Video is displayed at 30 frames per second
- Video overlaid with core status data
- Additional support status data displayed off of the video



EO/IR Video Display HCI





Data Flow (EO/IR Video)

AVSI/ Data Server
Object

AV_EOIR_Status

PL_Depression_Angle
PL_Active_Sensor
PL_IR_Polarity
PL_Image_Ang_to_North
PL_Image_Collection_Time_Week
PL_Image_Collection_Time_Second
PL_Depression_Angle
PL_LOS_Range_to_Target
PL_Center_Point_Lat
PL_Center_Point_Lon
PL_Azimuth_Angle
AV_Tail_Number

EO/ IR Viewer SW

Computations
 (four corners)
 and data
 reformatting for
 HCI displays

UI M Commands

AV_Heading
AV_Altitude
AV_Airspeed_1
AV_Airspeed_2
AV_Airspeed_Sensor_Active
AV_Ground_Speed
AV_Ground_Track

AV_Position_Status





Operation (EO/IR Video)

- Store status data as it arrives.
- Set internal flags that tell which AV/Payload status data items have changed since last update
- For each update of status data, determine what items changed and redraw the appropriate graphics.

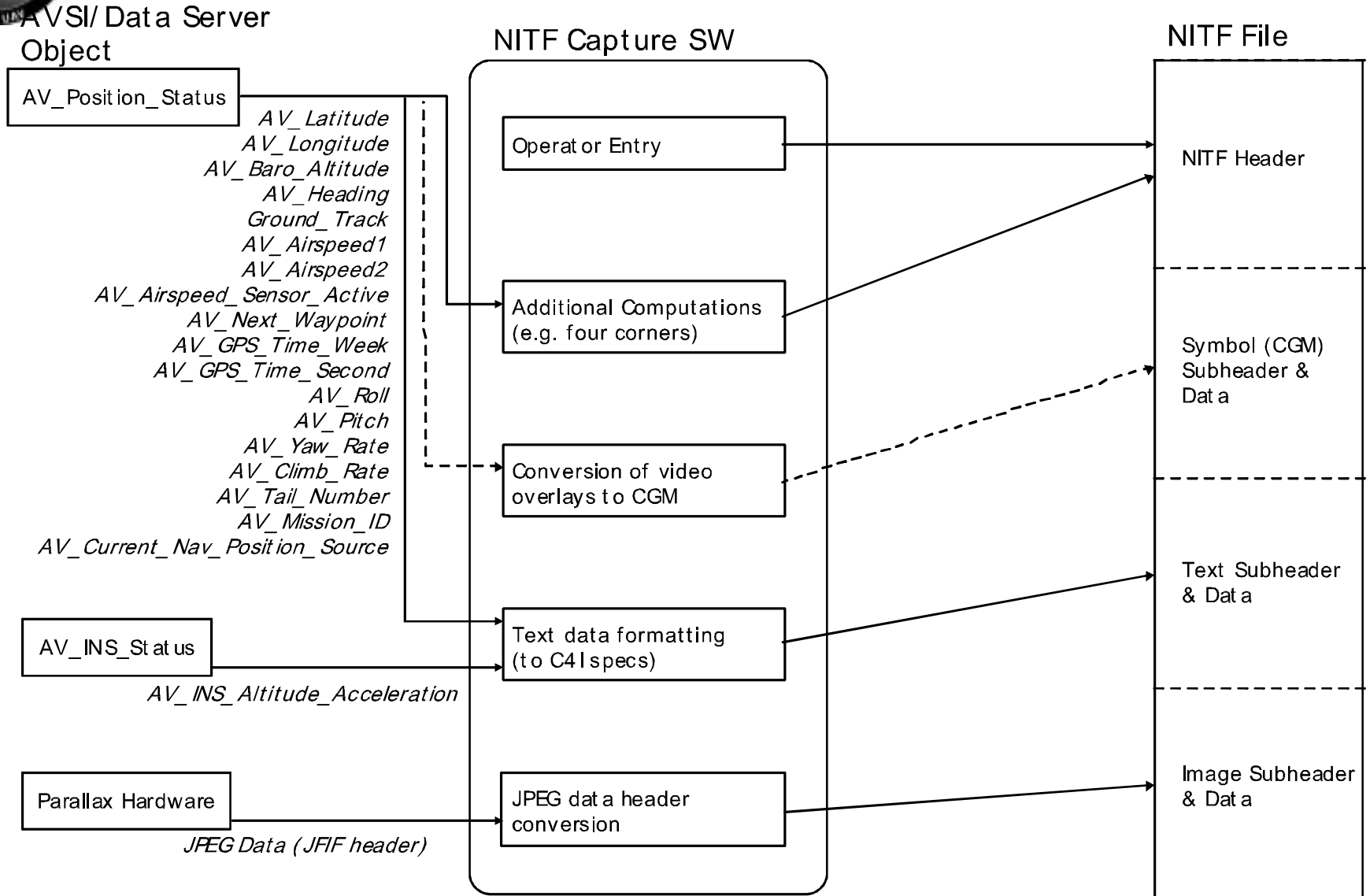


NITF Capture

- One step operator process
- AV telemetry data embedded automatically
- NITF header information computed and embedded automatically



Data Flow (NITF Capture)





Operation (NITF Capture)

- Compute/format NITF header information (4 corners, date, etc)
- Capture image data from Parallax H/W
- Format JPEG header for NITF compliance
- Format AV telemetry as text data
- Format video overlays as CGM
- Create blank NITF file
- Insert header data, image, text, and CGM symbols into NITF file

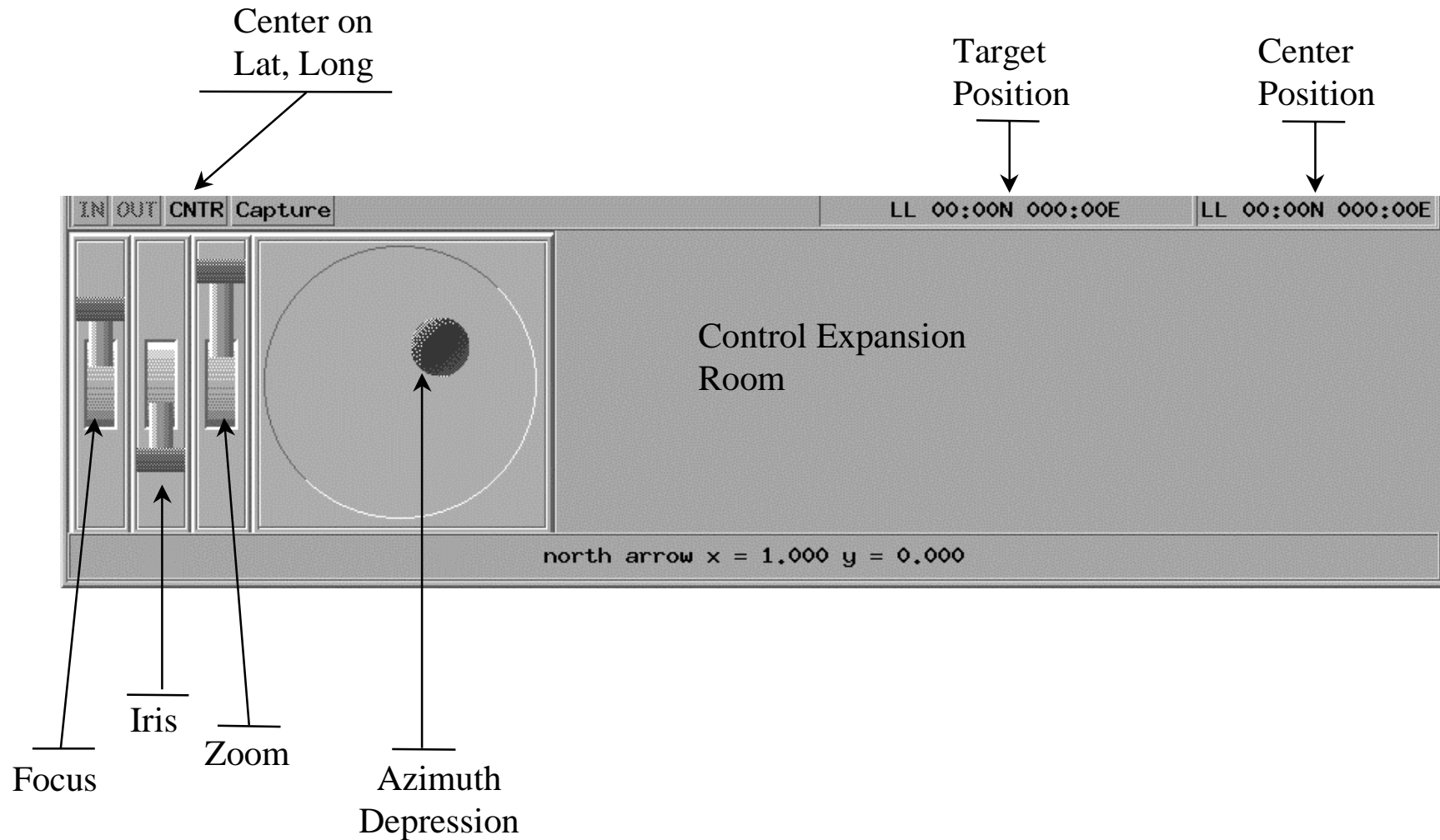


EO/IR Payload Controls

- Mix of graphical and textual based controls
 - standard GUI controls (buttons, text entry, etc)
 - graphical controls (joysticks, sliders)
 - operations on live video
- Used in conjunction with payload video display



EO/IR Payload Controls HCI





Data Flow (EO/IR Payload Controls)

AVSI/ Data Server
Object

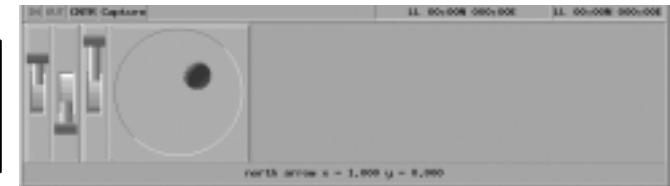
EOIR_Command

EO_Power
IR_Power
EOIR_Payload_Active
EOIR_Payload_Pointing_Mode
EOIR_Vertical_Mode
EOIR_Pointer_Latitude
EOIR_Pointer_Longitude
EOIR_Pointer_Altitude
EOIR_Depression
EOIR_Azimuth
EOIR_Depression_Rate
EOIR_Azimuth_Rate
EO_Payload_Camera_Select
EO_Payload_Zoom
EO_Payload_Focus
EO_Iris
IR_Payload_Camera_Select
IR_Payload_Zoom
IR_Payload_Focus
IR_Contrast
IR_Gain
IR_White_Hot
IR_Auto_Gain_Recalibrate

EO/ IR Control SW

Mapping from
control inputs
AVSI/ DS object
data items

ULMEvents





Operation (EO/IR Payload Controls)

- Receive events from window system as operator manipulates controls
 - For a continuous control, such as a slider, sample the state of the controls periodically, and format the appropriate Data Server objects
 - For a discrete control, such as a button, determine the state of the control and immediately format the appropriate DS objects
- Forward Data Server objects to AVSI



Combining Functionality for Different Roles

- CSC:
 - Reads role from DS object
 - Looks up required functionality for role
 - Creates required DS and UIM objects
- UIM:
 - Uses predetermined combination data to combine UIM objects into a single window



Combined Controls for MPO Role

